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Diversifying Network Participation: Study of India's Universal Service Instruments

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Introduction

The Indian telecom growth has become a benchmark for other infrastructure sectors in India, which are attempting to replicate the telecom *success* story. Between March 2004-05, the cumulative position of the number of phones changed from 76.53 million to 98.41 million phones, recording an impressive growth of 28.59 percent, translating into an overall teledensity of 9.11. We attempt to provide some perspective to this growth story. Despite these promising gains, many rural areas in India remain un-served by any communications network, fixed line or mobile. This is evident in the wide disparities in the rural and urban direct exchange lines (DELs). As on March 31, 2005, the total urban DELs were 32.74 million and rural DELs including Village Public Telephones (VPTs) were 13.45 million. Crudely, this means that 30 percent of the population had a little more than 70 percent of the phones and 70 percent of the population had less than 30 percent of the phones. Moreover, the overall teledensity figure does not reveal the huge gap between the urban and rural teledensity at 26.2 percent and 1.74 percent respectively. According to TRAI (2004), the prime reason for slow growth in rural telephony is the increased focus on cellular mobile infrastructure deployment after 2001-02 and reduction in fixed line and rural investment. The mobile sector grew at 55 percent in comparison to a 7.82 percent growth of fixed line between March 2004-05. Also, most of the rural DELs installed by BSNL have been funded by the government through license fees relief. Original licensees did have contractual obligations for the installation of DELs and a certain number of public phones in the villages. However, not a single operator has met its commitment. As against their commitment of establishing public phones in about 98,000 villages; they have in fact covered only about 12,000 villages. They rather opted to pay the penalty amount of Rs. 53 crores¹ in order to avoid their contractual obligations.

¹ 1 crore = 10 million; US \$1 = Rs 43.50 in June 2005, or Re 1 = 2.2 cents US.

**Table 1: Operator wise Urban and Rural DELs (nos.)**

S. No.	Fixed Service Operators	Area of Operation	31 st March 2005		
			Urban	Rural	Total
1	BSNL	All India (Except Delhi & Mumbai)	23,601,383	13,434,142	37,035,525
2.	MTNL	Delhi & Mumbai	4,066,919	0	4,066,919
3	Bharti Telenet Ltd.	Madhya Pradesh, Delhi, Haryana, Tamil Nadu, Chennai, Karnataka, Gujarat, Punjab, Maharashtra, Mumbai, U.P. (W) including Uttranchal, West Bengal and Kolkata	857,008	0	857,008
4	Tata Teleservices Ltd.	Maharashtra, Andhra Pradesh, Tamil Nadu, Chennai, Karnataka, Gujarat, Delhi, Bihar, Orissa, Rajasthan, Punjab, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, U.P.(E), U.P. (W) including Uttaranchal, West Bengal and Kolkata	2,574,730	1774	2,576,474
5	HFCL Infotel Ltd	Karnataka, Gujarat, Delhi, Bihar, Orissa, Rajasthan, Punjab, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, U.P. (E), U.P. (W) including Uttranchal, West Bengal and Kolkata	193,533	694	194,227
6	Shyam Telelink Ltd.	Rajasthan	149,022	8051	157,073
7	Reliance Infocomm. Ltd.	Andhra Pradesh, Bihar, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mumbai, Orissa, Punjab, Rajasthan, Tamil Nadu, Chennai, U.P. (E), U.P.(W), West Bengal, Kolkata	1,302,008	8791	1,310,799
Grand Total			32,744,603	13,453,422	46,198,025

Source: Performance Indicators, TRAI, June, 2005.

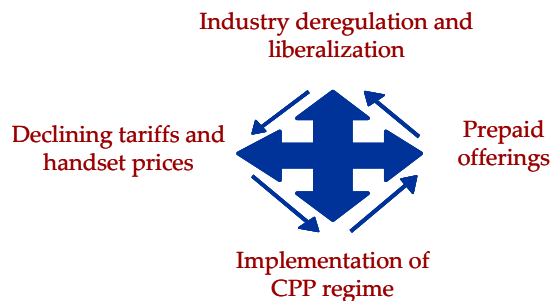
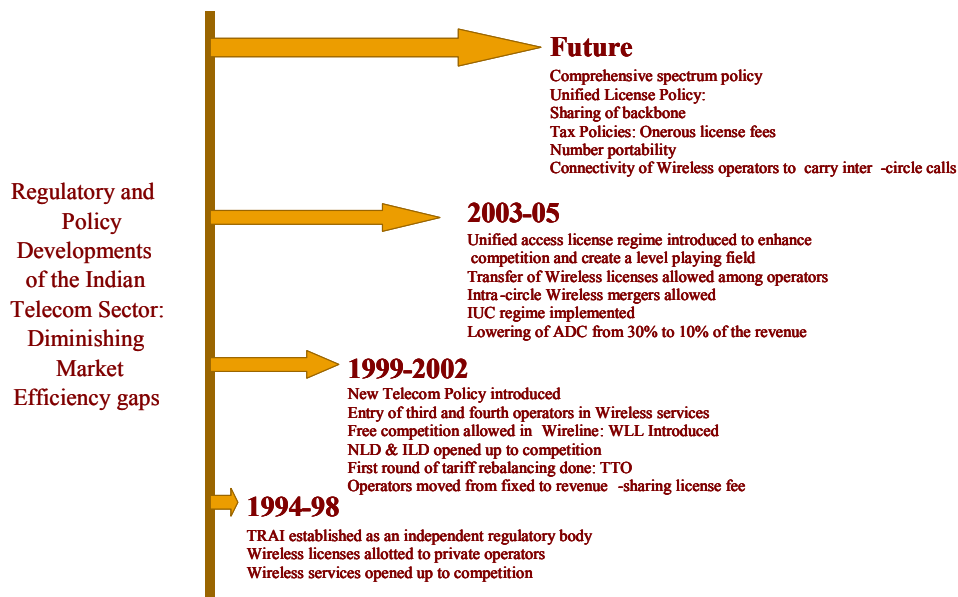
Moreover, as in many developing countries the telecom growth in India, has been fuelled by wireless growth. The subscriber base of 52.22 million wireless service users (as on March 31, 2005) outstripped the subscriber base of 46.19 million of fixed service users. In the absence of empirical data regarding the percentage of all wireless subscribers that do not have fixed access (either at home or at work) higher subscriber base and hence teledensity does not necessarily translate into higher access. There is no reliable data to ascertain the extent to which mobile networks are actually reaching to those households that do not have any access to telecommunications or are simply providing access opportunities to households that are already a part of the network. It will not be wrong to conjecture that the majority of the mobile network expansion is serving the already connected.

If one compares the Indian telecom growth story with that of China, the overall picture does not appear to be so promising either. Notwithstanding all the liberalisation and regulatory achievements of the past decade or so, which led to private sector led triple



growth in mobile telephones with teledensity (both mobile and fixed) 9.26 percent² today, India is still far behind. The fact remains that China had 344 million mobile users and another 319 million fixed line subscribers in February 2005, which translated into a teledensity of 25.9 per cent for mobiles and another 24.9 percent for fixed lines or 50.8 percent in all.

While a conducive regulatory and policy environment can improve network expansion, it is well recognized that rural telephony and extending telephony to the poor is necessarily prone to market failure. If the market fails on account of network externalities then there is a case to intervene in the market to serve these specific groups of people who have a low willingness to pay. Provision of rural telephones and their maintenance is expensive. The terrain is tough, demand is low, ability to pay limited and revenues generated often abysmally low. Consequently, the service has almost to be subsidised, though experts believe that much of rural communications can be viable in a more conducive regulatory environment.



² Estimate based on April 30, 2005 data, fixed lines are 46 million and mobile 53.65 million



In this paper we propose to review the current subsidy mechanism for expansion of rural telephony in India. This mechanism is implemented through two instruments:

- (a) Universal Service Fund (USF), a non lapsable fund created through a statute to finance network expansion in net high cost rural areas. The disbursement from this fund is made through a competitive least-cost subsidy mechanism. and;
- (b) Access Deficit Charge (ADC), which is a surcharge on interconnection fees to compensate [primarily] the incumbent for rental/local call charges, special concessionary local call charges in rural areas, provision of free calls, and any other below cost tariffs that the regulator may need to specify to make the basic telecom services affordable to the common man to promote both universal service and universal access as per NTP'99.

How well have these instruments fared and what have been the associated problems in their implementation? Do these instruments stand the test of an efficient subsidy scheme i.e. are they well targeted and create the least possible market distortion? What level of competition exists in their allocation, are some questions that this paper addresses. The paper is divided into two main sections. Section I of the paper provides the theoretical framework to analyse the universal service obligations (USO) including the issues of financing and disbursement. Documenting the status of USO in India and a critical analysis of the issues related to it follows this. There are important, higher level and strategic issues associated with USO: the impact of mobile telephony and broadband; the operation of USO in a competitive market? These issues are discussed in this section. The second section discusses the objective and the subsequent design and implementation of the ADC regime. It discusses the many issues that arose during its implementation and identifies the causes for the same; essentially it's over complexity. It thereafter analyses the current status of the ADC regime and postulates a number of questions that need answers by the regulator. The section ends by providing some possible solutions. The discussion is based on the many pieces of information publicly available on the pros and cons of ADC.

1.1 Rationale for Universal Service Obligations

There are several reasons given for imposing universal service obligations (USOs). First, it is often thought that utilities such as electricity, water and telecommunications services are necessities that should be readily available to all, simply on the grounds of equity. This argument can be supplemented with the idea that poor communications is one of the principal impediments in the path, not only of rapid economic growth, but also of development in its broader sense, including poverty alleviation. Under such circumstances USO can be seen as a special case of redistributive pricing, that is a policy meant to affect redistribution through prices instead of (or in addition to) income taxation and/or direct transfers. From that perspective it bears some similarities with policies involving public provision of private goods, in-kind transfers etc. The basic feature of these policies is that some essentially private goods like education, child care or health care are provided either free of charges or at subsidized prices (Cremer, Gasmi, Grimaud and Laffont 1998).



Economic literature, however, cautions that such policies are optimal in a second-best setting; that is when the policy makers do not have the necessary information to implement (potentially) more efficient policies like direct transfers. However, more importantly, there may be significant positive externalities associated with a service (such as a communication network) that the market, left unregulated, would fail to incorporate, leading to insufficient coverage of the network. A USO may be required to correct for this market failure.

The equity argument for USO is increasingly being used by policymakers around the world who deem telecommunications as a basic necessity of citizens, essential to full participation in the 'new information economy'. Thus, universal access is the goal adopted by many developing countries to provide convenient and affordable access to communications, at least on a community basis, through a combination of private and public access facilities such as payphones and telecentres. On the other hand in many developed countries USO not only includes access to a PSTN, but also to directory, selective outgoing call barring to premium service, emergency services and installation of payphones. In these countries, increasingly, USO also includes internet access to public schools and libraries at discounted prices. In developing countries, the focus continues to be on basic voice services.

The universal service strategy can be envisaged as focusing on two separate 'gaps', addressed with quite different mechanisms (Navas-Sabater, Dymond, and Juntunen 2002):

- The market efficiency gap is the difference between what markets actually achieve under current conditions, and what they can achieve if market barriers are removed. This gap can be bridged through effective competition, private provision of service, and market-oriented policies and regulations that create a level playing field for new entrants.
- The access gap – refers to the people and places which remain beyond the limits of the market unless additional investments are mobilized through intervention, in the form of subsidies to encourage service providers to enter.

In the past, monopoly operators had to assume the costs of meeting the country's universal access objectives. These operators had to finance the delivery of essential telephone services to uneconomic regions mainly through cross subsidies, which accrued from profitable market segments (e.g. international, long-distance, business users, urban) to less profitable market segments (e.g. domestic, local, residential users, rural). While cross-subsidies served their purpose in monopoly environments, they created problems in newly competitive environments. In particular, cross-subsidies have been known to distort market signals and place an unfair burden on certain operators. To finance their access objectives in a competitively neutral and transparent manner, an increasing number of countries are now turning to universal access funds.

However, some recent writings in economic literature on USO have questioned the justification of USO on equity grounds, since there may be better tools to achieve



redistribution. On the efficiency side, there is a sound theoretical argument for universal service programs. They can reduce the risk that customers may not subscribe to a network since they do not take into account the benefit they confer on existing users. Even if the marginal consumer confers a small externality, this has to be multiplied by large numbers. But it has also been pointed out there are also limits to this kind of justification for subsidies. While externalities may present reasons to intervene in principle, in practice any such intervention is likely to prove counterproductive. Even if such market failures exist, however, government should intervene only when the expected benefits of doing so outweigh the potential costs. That is, government should try to correct a market failure only when the risks of “government failure” are low. (Crandall, Hahn, Litan, and Wallsten 2004). Moreover, it may not be also obvious that the operators will not internalize the presence of these externalities and not expand their network *suo moto*. The operator may in fact find it profitable to coordinate consumers.

Whatever maybe the motivation for a USO, subsidies should be at the margin and it is not necessary to subsidize the majority of infra-marginal customers that would be on the network without any inducement. In this respect, targeted programs fare much better than uniform subsidies. Moreover, USOs are blunt instruments, for instance in the Indian context, USOs are aimed at the rural customers and a USO to cover high-cost rural areas might benefit high-income rural consumers at the expense of low-income urban consumers. Policymakers and regulators have to be careful with USOs since they tend to be used by market players to extract too many concessions. Ironically, the existence and scope of USO could also be a result of regulatory capture. There can be situations where the incumbent operator itself may use its leverage on the regulator to maintain a stringent USO as this may justify some of its privileges, e.g., monopoly protection in some market segments (Cremer, Gasmı, Grimaud and Laffont 2001). Recent research has also shown that USOs have important strategic implications and affect the way firms compete against each other. The design of the USO and its financing mechanism may affect the very nature of competition that can be sustained in the sector. It can affect the viability of the existing operators as well as the entry process in the industry. Thus it is important that countries should distinguish clearly between universal availability and universal service guarantees. The former is promoted by encouraging investments and removing entry barriers. Only the latter should be explicitly linked to possible costing and financing requirements. European Commission in its 1999 review recognized that universal service, and in particular universal service funds, are a real cost and a form of cross-subsidization, and therefore should not be used unless necessary. Other than France no other member state has an explicit universal service fund. The 1999 review also mentioned the possibility of abolishing the authorization of universal service funds, or conversely establishing “pay or play” schemes for universal service support. Second, the approach towards universal service should be technologically neutral, enabling wireline and wireless technologies to be used to provide services. It is important to maintain incentives for competing networks and/or technologies to provide (part of) the universal service provisions (Hoernig and Valletti 2002).



Another important consideration is that competition and universal service requirements based on cross-subsidies are at odds with each other, under these circumstances universal service policies gain new dimensions. First, they must be redefined to pursue the previous goals of guaranteeing a basic service in the new environment. Second, their design must explicitly take account of their impact on competition. One stated aim of the policy maker should be to devise policies that are 'competitively neutral', i.e. do not influence competition and let the market determine the efficient allocation of services. One of the oft adopted method of granting subventions placing companies in competition through a system of inverse bids, allowing considerable savings to be made as the bidder requiring the lowest subvention is the winner.

1.2 Issues in financing and disbursement of USF

USO although necessary, (once the policymaker has decided to use this instrument to expand subscription base) but is also costly and someone has to pay for it. When devising USO policies, governments must resolve the issue of the amount of money needed to fund the USO. This was not an issue under the traditional subsidy system. Financing these costs imposes distortions and regulators should try to minimize losses of allocative efficiency. The least distortionary way to finance net costs is probably from the government central budgets. Alternatively, funding should be recovered within the sector, raising a tax from the broadest possible base, in order to minimize the impact of the financial burden falling on end-users. Universal service taxes of this kind are more transparent in comparison to access surcharges as the financing of universal service is clearly separated from the issues such as (marginal) cost of access, the financing of network's fixed costs, which may affect the determination of access charges. The choice between funding from central budgets as opposed to universal service tax depends to a great extent on the efficiency of the tax system. Moreover, once introduced these obligations become permanent because of the political difficulty in eliminating them; and therefore should be small and funded out of general revenues — not through a tax on telecommunications services — to minimize the cost to the economy.

Even the best USF Administrators will generally have less information than telecommunications operators about the real costs and benefits of implementing rural public access telecommunications projects. Therefore competitive bidding approaches have been used to determine the actual subsidy amount disbursed for each project. Competitive bidding has the advantage of generally reducing the total funding required to meet universal access objectives. The actual winning bid amounts awarded in Latin American programmes were generally well below the maximum subsidy amount calculated by the USF Administrator to be required to provide service. In Chile, over the 1995-1999 period, the average winning subsidy was about 50% of the maximum subsidy offered. Similarly, in Peru, in 1999-2000, the average winning subsidy has been about 25% of the maximum subsidy offered. In the first set of projects auctioned in Colombia in 2000 the average winning subsidy was 45% of the maximum subsidy offered.

There are benefits from using auctions to assign USOs since the regulator does not need to calculate net costing. It also provides a useful means of testing whether or not there



exists a net universal service cost of serving uneconomic areas. There are also problems. It may be difficult to have sufficient participants bidding against the incumbent (in many cases entrants would need to use alternative infrastructure or acquire the use of the incumbent's assets), in particular if serving the areas is considered to be uneconomical. In practice, only the operators that have or willing to invest in, a costly infrastructure in the area in question might be interested in participating in the auction. Thus, a critical assumption of the success of these auctions is that they should be genuinely competitive, may be violated in practice. Another reason is the asymmetry of information between the incumbents and new entrants, for example concerning the costs and benefits of serving groups of customers. Large disaggregated data is required to evaluate the net cost of universal service; the incumbent may be at an advantage, when formulating the size of its bid. Moreover, as has been pointed out earlier, because of high infrastructure costs, few operators compete with the incumbent. Under such circumstances arises another regulatory and policy issue, as to have the incumbent lease its infrastructure to potential universal service providers. Even if it is legally and practically feasible to do so, it may still put the incumbent in an advantageous position when bidding against operators relying on transfer or lease of assets from their competitor (Cremer et al. 2001). If an auction is not feasible due to the reasons described then the regulator must calculate the net cost and then proceed to financing requirements.

1.3 Universal Service Obligation in India

The New Telecom Policy '99 (NTP'99) envisaged provision of access to basic telecom services to all at affordable and reasonable prices. Universal Service was one of the main objectives of NTP'99. Section 6.0 of the policy has laid down the following specific Universal Service targets:

- Provide voice and low speed data service to the balance 2.9 lakh uncovered villages in the country by the year 2002
- Achieve Internet access to all district head quarters by the year 2000
- Achieve telephone on demand in urban and rural areas by 2002

In addition NTP'99 has also set the following targets:

- Encourage development of telecom in rural areas making it more affordable by suitable tariff structure and making rural communication mandatory for all fixed service providers.
- Increase rural teledensity from the current level of 0.4 to 4 by the year 2010 and provide reliable transmission media in all rural areas.
- Achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.
- Provide high speed data and multimedia capability using technologies including ISDN to all



Keeping in line with NTP'99, the recommendations of Telecom Regulatory Authority of India (TRAI) on the issues relating to the Universal Service Obligation were sought. TRAI defines USO in the Indian context using the following three parameters:

- Availability: provision of telephone services whenever and wherever required even in remote and rural areas.
- Accessibility: Non-discriminatory tariff in the service area regardless of the geographic location. Non-discrimination in terms of service quality, price (imposing of a uniform pricing constraint)
- Affordability: Telephone service to be prices so that it is affordable to most users

Based on the decisions taken on the recommendations, the Universal Service Support Policy was framed. The Universal Service Support Policy has come into force from April 1, 2002. The implementation of Universal Service Support Policy is based on Indian Telegraph Act 1885 as amended by Indian Telegraph (Amendment) Act, 2004 (No. 8 of 2004) and the rules framed there under (See Annex 1 for the broad guidelines for the implementation of the Universal Support Policy). On January 9, 2004, the Universal Service Fund (USF) got a statutory non-lapsable status with the passing of the Indian Telegraph (Amendment) Act, 2004. The Act states

“Universal Service Obligation” means the obligation to provide access to basic telegraph services to people in rural and remote areas at affordable and reasonable prices”

Universal access funds can differ in their management. While some funds (e.g. Colombia) are administered by government ministries, other funds are administered by the regulators (e.g. Peru, Chile) or special agencies (e.g. South Africa). The common perception is that funds administered by independent regulators and agencies are less likely to be influenced by government or political interest. In India the USF is administered as a separate administrative organization set up as an attached office of the Department of Telecom (DoT) even though options of an Independent Authority/Regulator were considered for administering the fund. The universal service fund is based on an implicit assumption that competition among private providers will not generate service in rural areas without subsidies.

Prior to this the collections from USL for USO went to the Consolidated Fund of India. Thus despite operators having made contributions towards the fulfillment of the universal service obligations, network expansion was slow, as the funds were not released. However, giving a statutory status to the USF has gone a long way in expediting the disbursements and thereby effectuating the universal service policy. The resources for meeting the Universal Service Obligation (USO) are generated through a Universal Service Levy (USL), which is a percentage of the revenue earned by the operators under various licenses. The Universal Service Levy presently is 5% of the Adjusted Gross Revenue earned by all the operators except pure value added service providers like internet service providers, voice mail, e-mail etc. In addition to this any grants and loan made by the Central Government from time to time will also be used to fund. However, transfers to the USF are through appropriation by Parliament.



Almost USD 2 billion corpus is expected for the USF disbursement schemes during the 10th Five Year Plan (2002-2007). Till March 2005 Rs.6000 crores (almost USD 1.3 billion) had been contributed to the USF. The following table documents the disbursement schedule from the USF till March 2005. Almost 50 percent of the amount collected is deployed or provided for USO projects. It is important to acknowledge that the USF has been successful in a speedy implementation of projects from the date of the inception of the USO policy. TRAI has recommended a speedier disbursement of funds as USO disbursements and the ADC requirements are linked inextricably. With smooth and early disbursement of USO funds, the amount of ADC funding required will keep going down, because the methodology used by TRAI is such that as the USO funding increases, the amount of ADC funding requirement decreases. Thus it is extremely important that the amount of USO funds collected by the Government should be disbursed for this purpose by providing the amounts to the USF Administrator. Otherwise while the USO funds would be collected by the Government from the license fee, but due to their non-disbursement, it will not be possible to reduce the ADC charge by the maximum amount possible, and the consumer will continue to bear a relatively higher ADC burden.

Table 2: Disbursement Schedule for the USO funds

Year	Amount Disbursed/ Provision
2002-2003	Rs. 300 crores (66 million USD) of the Rs.1653 crores (USD 367 million) collected
2003-2004	Rs. 200 crores (44 million USD) of the estimated Rs. 2143 crores (476 million USD) collected
2004-2005	Rs. 1200 crores (266 million USD) of the estimated Rs. 2800 crores (636 million USD) collected
2005-2006*	Rs. 1200 crores (266 million USD)

Note: * Provided for in the Union Budget for the fiscal year 2005-06

In order to disburse the collected funds, a least cost subsidy auction mechanism has been adopted. The bidding process for the provision of rural household direct exchange lines (RDELs) in specified short distance charging areas (SDCAs) is summarized in Annex 2. In the following table we provide the auction results for the various USO projects.

**Table 3: Status of various USO Projects in India**

Project	Implementation Dates	Comments
Operation and Maintenance of Village Public Telephones (VPTs) in the revenue villages identified as per Census 1991. Approximately 520,000 villages	March, 2003	This includes support for 9171 VPTs installed by the Six Private BSO and remaining 5,09,775 VPTs installed by BSNL. This provides coverage of more than 90% of the villages where VPTs are to be provided. Firms participating in this auction bid exactly the benchmark.
Replacement of Multi Access Radio Relay Technology VPTs installed before 1 st April 2002. 1, 80,000 MARR VPTs	September, 2003	Since the VPTs were mainly BSNL's, the subsidy went to BSNL with a zero cost reduction, bid exactly the benchmark
Provision of additional rural community phones (RCPs) in areas after achieving the target of one VPT in every revenue village (2 nd VPT). 46,253 RCPs.	September 30, 2004	Out of 300 Secondary Switching Areas (SSAs), BSNL was the successful bidder in 184, Reliance Infocom won 97. Competition between two service providers in only 115 SSAs. The competitive bidding has resulted in bringing down the cost of the project by about 17% from the reserve price
Provision of VPTs in revenue villages as per Census 1991 without any public telephone facility. No. of villages covered : 66,822	November, 10, 2004	BSNL emerged successful for 12 service areas where six companies participated, BSNL had one-to-one competition with Bharti Cellular Ltd (BCL) in three service areas –Andhra Pradesh, Orissa and UP (West), comprising 6,221 VPTs (village public telephones), As a result of the competition in these three service areas, there was a reduction of 15-20 per cent in the overall subsidy to be given for VPTs. in the nine service areas BSNL was the sole bidder. Hence, BSNL emerged the winner in all the Service Areas
Provision of rural household direct exchange lines (rdels) in specified short distance charging areas	March 15, 2005	The project covers 274 (SSAs), competitive bidding in 215 SSAs, BSNL emerged the most successful bidder winning in 171 SSAs across 19 States, Reliance Infocomm emerged the winner in 61 SSAs spread across 15 States while Tata Teleservices got the project in 42 SSAs across 9 States, competitive bids have brought down the cost of the project by 60-75 per cent

Source: Collated from economic press and interviews with USF officials

In addition to the above nearly 8.6 million rural DELs, which had been installed prior to 1.4.2002 are being supported by the USF. The support is for differential in TRAI prescribed rental and the rental actually charged and is for the period 1.4.2002 to



31.1.2004, since ADC became effective. Parallel action is on for drafting Tender documents and working out the benchmarks for the remaining activity under USO; viz; installation of PTICs and HPTICs falling under Stream-I of the USO policy. Considering the requirement to involve outside agencies by the service providers for running and maintaining the kiosks, development of content and identification of sites for a viable business proposition, it has been decided to take up on a pilot basis for about 2000 villages. (www.dot.nic.in)

1.4 Key issues of India's universal service programme

Having outlined the status of the universal service projects and their implementation, we briefly discuss some of the key issues of the nature and the implementation of the Universal Service policy.

1.4.1 Eligibility for support

An issue which requires attention in the Indian context is whether the USF should support individual/private rural telephones or should it be restricted to payphones. The USO policy had identified the implementation of USO into two clearly identifiable streams: -

- Stream-I: Provision of Public Telecom and Information services; and
- Stream-II: Provision of household telephones in identified Net High Cost Areas (rural/remote)

While universal service is a realistic policy objective in many industrialised countries, universal access is a more practical goal in most developing countries. There is no denial of the fact that universal access policies must work to increase *access* to telecommunications services on a shared basis, such as on a *community or village-wide level*. These universal access programs typically promote the installation of public payphones or public call offices in rural or remote villages or low-income urban areas with the aim of providing a basic and initial connection to the public telecommunications network. Thus, the Indian universal service policy has gone beyond access and has also incorporated some elements of universal service in as much as it has taken the onus of provision of household telephones. Rakesh Mohan, a part-time member of TRAI, had favoured restricting USO to public telephones as he feared that private rural connections may go to well-off families, which did not deserve the subsidy. The other members, however, overruled him. As has been mentioned in the discussion above, the funding of universal service is distortionary as it taxes the operators and secondly it has strategic implications, the overextending of the universal support has its repercussions on the level of competition and in hampering the market based solutions to the extension of network to the unreached.

1.4.2 Costing of the benchmark

The approach adopted by the USF to determine the benchmark for the least cost subsidy was a top-down approach, where the capital costs, were obtained mostly from BSNL and a few private operators. They were the costs for bulk procurement of latest technology-based equipment in purchases currently under finalization and in that sense were



'forward looking'. These costs were not linked to optimal network designs based on geocoded data specific to each service area but were based on standard efficiency norms for network design. This was quite different from what the regulator had recommended. In its recommendations TRAI had pointed out:

"To ensure that BSOs do not over estimate the cost figures of providing an optimal VPT connection, the USF Administrator should quickly develop proxy cost model(s) to assess the most optimal cost of providing VPTs based on their location, technology employed, and distance from the nearest exchange".

The Net Cost was calculated as follows:

Net Cost = [{Annualized Capital Recovery + Annual Operating Cost} - {Annual Revenue}];
Where Annualized Capital Recovery = Aggregate of depreciation + return on equity plus interest on debt.

1.4.3 Scope of USO

Till recently only fixed wire lines (landline) and wireless in local loop technology (fixed WLL), qualified for subsidy support from USO Fund. By restricting the subsidy support to these technologies alone meant that the bidding was not open to different competing technologies. In the absence of ex-ante competition (in the presence of a non-liberal and a tight licensing regime), it is quite possible that the price discovery (of the appropriate subsidy amount) through the subsidy auction was limited. The narrow technology-centric approach followed so far has not fully exploited the advantages of a well designed auction which would reveal carriers' valuations of the USO, determine the number of USO providers endogenously, and hence provide an alternative to traditional cost-of-service regulation. In most of the Latin American countries the mandatory services were defined in such a manner that many different types of technologies could have been used. In fact, satellite, radio, cellular and wireline technologies, sometimes in combination, have been employed successfully to provide mandatory services.

Moreover, by restricting participation in the auction to already existing phone companies (in the SSAs) meant that it hugely favoured the incumbent that was omnipresent. This exclusivity provision meant that the auction failed to create competition for the market. Consequently, the provision of the subsidized service mostly by the incumbent, who will receive a large portion of the subsidy will discourage new firms from entering [as they will not be able to compete without subsidy] and preclude competition in the market. The Chilean model of the least cost subsidy auction which has become a blueprint for subsidy auctions of the kind followed in India allowed existing as well as new operating companies, subject only to minimal legal requirements, to bid. Wireless communications is extending the limits of the market place and reaching out into areas unserved by the fixed network, often at lower cost. Some funds will find that they can target some areas with lower subsidies *and* lower risks. The mobile explosion will also mean that some funds can focus almost exclusively on the most remote geographical localities.



According to the eligibility requirements for the participation in the auction, the operators were required to bid either for all the eligible SDCAs in a service area or for all the eligible SDCAs in one or more SSAs in the Service Area for which they hold a licence for running basic / cellular / unified access services. Thus, only those operators who had the infrastructure to carry the traffic to all the SDCAs in a given SSA could venture to participate in the auctions. The current policy consciously or inadvertently stimulated entry of only large companies by mandating a license for the entire circle. This, in turn, impeded the entry of small and medium entrepreneurs who might exploit the available technologies to evolve creative solutions for rural connectivity. Against this, a policy option for enhancing telecom penetration in rural areas is the introduction of a "niche operator"³ license, which would be allocated to operators providing service only in rural areas. These operators shall be allowed to connect to the nearest exchange of the BSNL or another existing BSO. They shall be allowed to offer other communication services that a village requires, such as cable television and Internet access.

As mentioned earlier, it is important to maintain incentives for competing networks and/or technologies to provide the universal service provisions and this has been overlooked in the current framework. Recently, the Department of Telecommunications (DoT) has announced that it is in the process of amending the Indian Telegraph Act to extend the Universal Service Obligation (USO) fund support to cellular mobile services (both GSM and CDMA). As of today, the government is giving USO fund support to only the fixed line operators offering services in the rural areas. The over defining terms in the law is a bad idea in a rapidly evolving technology environment, though this correction has been suggested it is quite possible that the previous auctions have left huge amounts of rents that have been appropriated by the incumbent. In an industry that manifests the potential for rapid technological change and innovation, such as telecom, an economic analysis of a problem should not focus too narrowly or exclusively on the best use of society's resources from the standpoint of today's technology and resource availability i.e. static economic efficiency but should be viewed from a dynamic perspective. The government should, at the most, set basic minimum standards of service that any claimant of the fund should meet. Moreover, the proposed amendment should be flexible enough to allow upcoming technologies such as WiMax to make use of USO funds.

The arguments which have been put to defend this sequential approach to the disbursement of the fund proceeds are that the private operators by and large had reneged from their roll out obligations by paying the contractual indemnities. Only five basic operators were really functional in mid 2002. They were not yet equipped to take up a scheme of this dimension covering the whole country as it would have tied up too much of their resources. Even though the private operators had built essential facilities the network was not as widespread as the incumbent. Mobile operators who were also eligible to quote were even less equipped and inclined as they were focusing

³ The concept has been introduced by TRAI, in its recommendations to the MC&IT on Unified licenses on January 13, 2005. Available at www.trai.gov.in.



understandably on cities; extending their network of towers to the more remote areas would have been time and resource consuming.

Funds had started accruing to the USO; if they remained unspent, there would be understandable criticism of the whole scheme. The target to connect every village in the country had already been pushed back twice or thrice from 1999 to March 2002 and the politically acceptable revision of target would not go beyond March 2003. So here was a stark choice between waiting for the market to mature so as to discover the prices through competition and pushing the scheme so that the population in the most backward of regions (populating the equivalent of the entire population of the US) has one slender link of connectivity to the outside world.

1.4.4 Issues related to Infrastructure Sharing

The commercial, legal and regulatory implications of the fact that the incumbent had a fair amount of network in place were not taken into account while designing and implementing the auction. TRAI in its consultation paper on rural telephony has acknowledged the existence of a massive fiber optic network within the country, amounting to 6.7 lakh of route km. However, the critical questions are whether the geographical coverage is adequate, whether all this fiber is lit and in use, and whether there is an effective, non-discriminatory and cost-based access regime for the use of this capacity by all operators, especially the new entrants. (In fact according to the eligibility requirements, for participating in the auction, it was specified that the sole responsibility to set up infrastructure for providing these rural household DELs in all the identified SDCA of the service area was of the bidders.) Unless such a regime exists and is enforced, it is extremely difficult for operators without large subscriber bases in the rural areas to enter those markets in a cost-effective way. Indeed, if such an access regime does not exist, it may even be possible to conclude that it constitutes an anticompetitive barrier in the rural markets. Unless the fiber is actually used, we are talking about vanity investments by the incumbent (LIRNEasia 2004).

TRAI also notes that BSNL already has 30,000 exchanges, which are connected by fibre. This implies an average of 4-5 exchanges per block are connected by fibre. In addition, private operators like Tata, Reliance and Bharti have laid their own new networks. Leased line providers like Railways, Power-Grid and GAIL have also laid large optic fibre networks. Most of this capacity has not been lit. It is evident that by using the existing infrastructure, it would be possible to connect the entire country without sizeable incremental investment. Lighting up fibre optical network is only 20 per cent of the costs of laying down the network. For extending the fibre connectivity up to each village, wireless connectivity including WiFi/Wi-Max or in some cases just tapping existing fibre could be considered. Thus there are enough existing resources in the country to launch major internet, broadband, telephone connectivity and e-Governance projects. However, this has to be done in the most economically viable, efficient and beneficial manner. Thus, it is essential that under these circumstances it might be prudent to have regulatory certainty on the issue of how the incumbent will be asked to share its infrastructure and what is the efficient way of doing the same. This is very important, as



there are significant costs to consumer welfare that a subsidy laden universal service programme can cause.

Issues of infrastructure sharing do not lend themselves to any "cookie cutter" solutions and the regulator indeed has to tread carefully in these matters. Many tradeoffs are involved and the final solution has to keep in mind the incentive structure that the regulations will produce. Our view is that it all depends on the details and on the presence of alternative infrastructures (eg cable). In the US mandatory unbundling (UNE-P) did not work as they did "too much", so entrants could just sit on the incumbent's network. The European perspective is that some unbundling is necessary as otherwise you'll never be able to create competition, however at some stage entrants must have their own facilities. This is sometimes referred to as the "ladder of investments", so unbundling can help move up the ladder. Unbundling should be one of the several tools in the policy maker's arsenal of pro-entry policies that will hopefully lead to facilities based infrastructure competition (on either a wholesale or vertically integrated basis). Once this demand is realised and facilities based competition exists, in that case, mandatory asymmetrical unbundling should, in theory, no longer necessary⁴. Precaution should be taken that unbundling should not be used to create a static incumbent centric perpetual resale model, where everybody purchases their primary input from a single monopoly provider. Unbundling can be viewed as a two-stage process. In the first stage unbundling should be used to stimulate new alternative non-incumbent demand. In the second stage new facilities based entry should be encouraged to serve this consolidated demand.

1.4.5 Market "Efficiency" Gaps

The future sustainability of the universal service rests crucially on removing regulatory barriers to competition, which in turn depend upon on a liberal and a minimalist licensing regime. The licenses create a situation of artificial scarcity, and allow the licensor to enjoy monopoly rents in its capacity as a provider of the licenses. The solution, as has been pointed out by TRAI chairman, is that let the licenses, where you must have them, be automatic authorizations. The entry of more firms is the *sine qua non* of the universal service. Though the regulator has tried to address some of the restrictive licensing issues in its recommendations to the DoT on unified licensing, the policy maker is yet to announce the policy for the same.

Attempts have also to be made to alter the structure of the industry, in such a way to make entry profitable, and therefore, viable competition more likely. The US experience has shown that without entry, competition in the local exchange market will remain nothing else but an ephemeral dream and a fabrication of the incumbent monopolist and their representatives. A legislation that reduces entry barriers can increase the number of firms in the industry. One way to make entry profitable is to change the industry

⁴ From a transaction cost perspective a more efficient alternative would be to impose mandatory divestiture of the incumbent's loop plant from its marketing arm, rather than imposing stringent price, conduct and structural regulation on the incumbent for infrastructure sharing. This option may however be politically difficult.



structure such that there is an alternative distribution company, which sells loop and other network services to all the service providers on a non-discriminatory basis in direct competition with the incumbent local exchange carrier. This will also incentivise the incumbent to divest voluntarily its loop functions from its marketing functions, because it will simply find it more efficient to do this under a new market structure. It is not unreasonable to conceive of an industry structure, where a new entrant is not a service provider but a provider of all infrastructure network elements and would therefore act as a competitive and ubiquitous alternative wholesale distribution company. This will create incentives for the incumbent to put its own infrastructure for third party use when under competitive pressure rather than imposing a regulatory fiat to divest its loop (Naftel and Spiwak 2000).

Another important regulatory barrier to entry is the endogenous costs of doing business on account of the onerous burden of various license fees and taxes. Ironically a large portion of the license fee goes to fund the universal service fund (See Annex 3.1 to 3.4). As shown substantial sums of gross revenue of the operators go to the universal service fund. Not only do these huge contributions impose a significant dead weight efficiency loss on the consumer welfare but act as a major entry deterrent for the new firms especially the small players. This discourages initiatives for rural telephony from local cooperatives and small businesses, reflecting a locally based private/public demand pull model of network development, rather than a nationally-based supply push model.

Another reason for high demands on the USF stems from the fact that the focus of the USF has been just on telephony. Since most of the cost is in the access network (the 'last mile') it is only commonsense to use the same last mile in a public place for other applications (like e-governance, e-learning and tele-medicine) as well. That way, not only the revenue opportunities would be enhanced, the local community support would come forth unlike the prevailing system where the VPT is usually housed in the house of the village chief where about two-third of the locals do not get access – due to reasons such as discrimination based on gender and caste.



2.0 Access Deficit Charge

Given our objective to review the mechanisms for expansion of rural telephony in India, we considered the Universal Service Obligation (USO) in the first component of the paper. In this second component, we focus our attention on the Access Deficit Charge (ADC).

Internationally, the fundamental principle of ADC is that it is the compensation of the *difference between the actual cost of providing service and the mandated lower tariffs for providing subsidized access services to a class of subscribers.*

2.1 Background

With the opening up of the Indian telecom service market for private sector participation the national and international long distance markets opened up to competition. These policy measures resulted in a significant reduction in long distance tariffs due to competitive pressures which reduced margins available to fund the “access deficit” incurred by Basic Service Operators (BSO).

In this background the Telecom Regulatory Authority of India (TRAI) considered it important to specify a cost-based Interconnection Usage Charge (IUC) regime which would give greater certainty to the Interoperator settlement process. Therefore, TRAI, on 24 January 2003 specified an IUC regime on origination, transit and termination. ADC was included in the origination and termination usage charges and was made payable to BSOs with the intension of keeping the rental and local calls affordable both in rural as well as urban areas.

In its original January 2003 notification, TRAI mentioned that “The exercise to determine IUCs involved an assessment of the various cost items attributable to the different network elements involved in setting up of a call in a multi-operator environment. Every effort was made to accurately assess the network element costs based on the inputs provided by various operators including the incumbent.” In fact the methodology for these calculations was announced by TRAI in December 2001 and a consultation paper on the subject released in September 2002. As detailed therein IUC was to be determined based on minutes of usage for various unbundled network elements and the cost of these elements.

TRAI in its notification, calculated the ADC by taking into consideration, what it called “an affordable level for rental/local call charges, special concessionary local call charges in the **rural** areas, provision of free calls, and any other below cost tariffs that the Regulator may need to specify to make basic telecom services affordable to the common man to promote both universal service and universal access as per NTP’99.”

However, calculating the ADC was not straight forward. In the absence of actual cost data, TRAI originally used a proxy model, but could not reconcile the resulting figures with the incumbent BSNL internal network element figures that the provider made



available later. Not having been able to successfully clarify the discrepancies with the incumbent (BSNL figures were much higher), TRAI used the 2001-02 balance sheet of BSNL that was publicly available. In calculating the ADC, TRAI used what it called a “reasonable return on the investment made”, i.e. a return on capital employed of 13.78%. Estimating minutes attributable to various network elements was a challenge in the face of unavailability of actual operator data. TRAI therefore used BSNL submissions as per April 2002 and set the long-distance minutes of usage as 22% of total minutes for the ADC calculations. Another decision by TRAI when calculating the ADC was to exclude the reimbursements BSNL got from the Government for revenue share license fees and spectrum charges they had paid, on the grounds that these cost items depended upon revenues earned.

The result of these calculations, was to arrive at a cost based monthly rental to be INR 424. Given the data from BSNL showing the incumbent’s recovery on account of monthly rental was in the range of INR 165 to INR 175 per month, TRAI proposed the unmet amount of INR 249 to INR 259 per month per DEL need to be recovered through ADC. By also including free calls that had to be included in the standard tariff packages, the per minute ADC was calculated to be INR 1.00 for local calls and INR 1.00 plus the long distance carriage charge for long distance calls. But given tariff ceilings on local calls of INR 0.80, INR 1.00 or INR 1.20 per local MCU of 2 minutes duration, the portion of access deficit not covered by the local calls had to be recovered from long distance calls. Therefore distance categories were set as the following: up to 50 Km; 50 to 200 Km; 200 to 500 Km; beyond 500 Km and international long distance calls. Accordingly TRAI ruled that *for all BSOs, fixed line calls, either at one or both ends of the call, attracted ADC*. TRAI also ruled that cellular mobile and WLL-M did not have any access deficit on account of rentals and free calls, nor below cost call charges in the market determined tariff regime under which it operated.

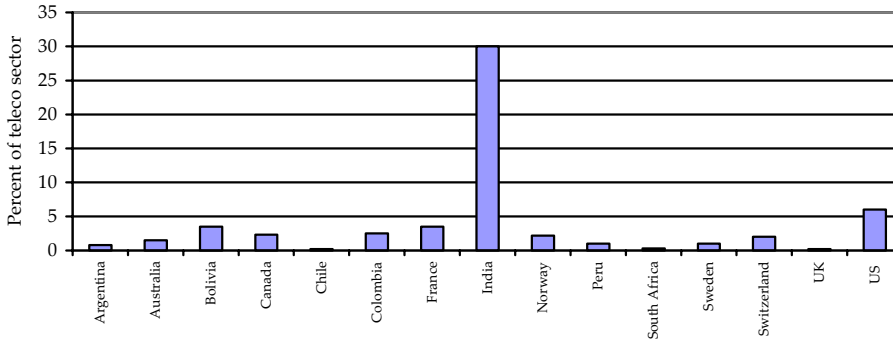
The ADC calculation was already quite complex. In addition TRAI noted that given the incomplete status of implementation of the inter-carrier charge billing systems of the incumbent it may be difficult to implement inter-carrier settlements within a multi-operator environment until the technical problems were sorted out. Therefore, in the interim period, until differential ADC could be implemented, TRAI provided two alternative models to recover the same amount of IUC; one of which gave uniform ADC for inter-circle calls above 50 Km and the other a differential ADC based on distance.

The result was a set of ADC amounts based on type of originating technology, type of terminating technology, whether the calls were inter or intra-circle and the distance band. The final ADC amount within India ranged from either none or INR 0.50, INR 1.25 and INR 2.00 per minute. ADC for incoming and outgoing international long distance calls were set at INR 5.00 per minute.

Based on the above calculation the total amount of funds to be actually collected and paid to fixed line BSOs through the ADC regime was estimated to be INR 130,000 million per year amounting to 30% of the total revenue of the telecom sector. The following chart 2.1 compares this figure with several other countries:



Chart 2.1: Comparison of ADC Amount as a Percentage of Telecom Sector



Source: TRAI

These figures immediately raise a question as to whether the size of the Indian ADC was justifiable from a sustainability perspective. In fact, the lower ADC in other countries at the time was partly due to tariff re-balancing having been achieved to a substantial degree before liberalization. Also revenues on local access and rentals were higher on average in the other countries.

However, in justifying the large ADC, TRAI made the following statement: “Since higher tariffs and ARPUs are not sustainable for India, especially in view of our objective to have a rapid growth in tele-density, it is important to cover the access deficit for some years till a reasonable stable consumer base is developed, which can be sustainable, despite low rentals and tariffs.” Many saw this as an attempt to sustain the business of the incumbent mainly at the expense of private operators.

2.2 Implementation

TRAI had initially envisaged the implementation of the ADC regime by 1 April 2003. However, with several service providers submitting alternative plans in the interim, the implementation finally got underway on 1 May 2003. But just as the implementation commenced, it became obvious that the TRAI had created an unequal playing field by bringing in complex and confusing arguments to determine multiple ADC amounts by insisting that technology and distance mattered in the decision. It further complicated the calculation by using unsubstantiated historical costs (only from incumbent) in calculating the ADC.

At a more macro level, *the logic of ADC seemed to have created a fixed wire-line bubble that would burst unless continuously supported by ADC (or some other format of a subsidy).* This was because through ADC, all operators were levied a fee to prop up the fixed line incumbent who could not compete in the market without the same.



In any case, TRAI pushed ahead with implementing the ADC regime. But soon the fixed line tariffs submitted for approval by the incumbent BSNL showed that these tariffs were below the levels required to cover the IUC plus ADC amounts, i.e. they were in effect below the costs embodied in the IUC (and ADC) regime. Even though this was the case, TRAI was “forced” (in their own words) to accept these tariffs of the incumbent mainly on the grounds that below cost prices being charged by the incumbent were not to kill competition, but to survive in business and hence were not predatory in nature. Consequently other BSOs also had to reduce tariffs to below cost levels, thus necessitating a re-look at the entire regime. Such lowering of tariffs obviously impacted upon the recoveries of ADCs amounts envisaged.

Table 2.2 below provides a comparison of the IUC plus ADC charges set by TRAI and the actual applied tariffs in the intra-circle case.

Table 2.2: Actual vs. Applied Tariffs for Intra-Circle Calls

Comparison of Tariffs and IUC plus ADC Charges as applicable under the IUC Regulation of January 2003

(INTRA CIRCLE)								
	> 500 Kms		200 – 500 Kms		50 - 200 Kms		0 - 50 Kms	
	IUC + ADC under Uniform ADC regime	Applied tariffs	IUC + ADC under Uniform ADC regime	Applied tariffs	IUC + ADC under Uniform ADC regime	Applied tariffs	IUC + ADC under Uniform ADC regime	Applied tariffs
F - F	5.10	2.40	4.75	2.40	2.45	1.20/ 2.40	0.70	0.40
F - W	3.60	2.40	3.25	2.40	1.95	1.20/ 2.40	0.95	0.80
F - C	1.20	2.40	1.20	2.40	1.20	2.40	1.20	2.40
W - F	3.50	2.40	3.15	2.40	1.85	1.20/ 2.40	0.85	0.80
W - W	2.00	2.40	1.65	2.40	1.35	1.20/ 2.40	1.10	0.40
W - C	1.00	2.40	1.00	2.40	1.00	2.40	1.00	2.40
C - F	1.20	1.80	1.20	1.80	1.20	1.80	1.20	1.80
C - W	1.00	1.80	1.00	1.80	1.00	1.80	1.00	1.80
C - C	0.80	1.40	0.80	1.40	0.80	1.40	0.80	1.40

F: Fixed or WLL-F; W: WLL-M; C: Cellular

Source: TRAI; IUC Regulation 29 October 2003

2.3 Implementation Problems and Solutions

In this background and with the difficulty in applying the ADC regime starting to be felt by the various operators, the industry (and consumer groups) raised several issues. In order to resolve these concerns TRAI put out a Consultation Paper in May 2003. Several key concerns the consultation attempted to resolve and how they were addressed are highlighted below:

- *ADC calculations should be forward looking not historical*



Industry suggested that instead of historical figures that were used to calculate ADC, TRAI should conduct its analysis based on Forward Looking Long Run Incremental Costs (FLLRIC), taking account of new and emerging cost effective technology.

TRAI having considered the evidence ruled that while it was imperative that the calculation be based on FLLRIC over a period of time, it would not be wise to shift from historical costs in one time period. The argument that, BSNL had provided the bulk of all rural services and that it had over time supported low paying subscribers and also that such a shift would adversely impact BSNL not only in rural services but nation-wide played a more important role than a pure efficiency argument. TRAI was of the view that with BSNL deploying new technology and lower cost equipment in its expansion programme, some part of the existing high cost network will be gradually replaced by such equipment reducing the need for high ADC. Given this background TRAI decided to continue with historical pricing, but be current as much as possible and also obtain costs for other BSO as well.

It is evident that this policy decision was biased towards protecting the interests of the incumbent than being one that would have promoted competition using emerging technology.

- *ADC calculations should be adjusted for various concessions granted by the Government to BSNL*

Having considered the reimbursement of license fees and other concessions to BSNL from the Government, TRAI made several changes to its calculation of the ADC based on the BSNL figures to make the same more reflective of reality. Assistance provided to BSNL by the Government was incorporated in calculating the access deficit for BSNL.

These revisions impacted significantly on the total ADC. This figure was thus revised downward from the original INR 130,000 million to INR 63,300 million (INR 53,350 only for BSNL). These revisions caused the estimated access deficit to be revised downwards to around 10-12% of the sector revenue from the original 30%.

- *MTNL and private BSOs should not be given ADC in light of their presence in urban areas and the roll-out obligations remaining mostly unmet*

TRAI considered using independent normative techniques to measure the access deficit of a number of BSOs including MTNL and concluded that they continue to have some access deficit, but they were much smaller than the amounts calculated for them on the basis of their own cost data. At the same time TRAI also noted the fact that a number of cases the BSO had not met their roll-out obligations, particularly for village public telephones (VPTs) that the old BSOs had to install. In contrast to non-BSNL operators, TRAI observed that most of the rural DELs were provided by BSNL, which also provided connections to a relatively large number of



low users as seen in Table 2.3. It also pointed out that in general, in other countries, ADC is paid only to the incumbent and not to new comers.

Table 2.3: Commitment vs. Actual Rollout of Rural Telephones by Private BSOs
Comparison of License Rollout requirement and actual Roll out for six Old BSOs

Licensee (Effective Date of License)	Roll out under License within 3 years, compared with Actual Roll Out as on 31-08-2003			
	DELs		VPTs	
	Commitment	Actual Rollout	Commitment	Actual Rollout
Tata Teleservices (30-09-1997)- A.P.	300000	313424	9635	1347
Bharti Teletel Ltd. (30-09-1997)- M.P.	150000	218466	16500	607
Shyam Teletelink Ltd. (04-03-1998)- Rajasthan	146909	95129	31834	2798
Tata Teleservices (Maharashtra) Ltd. (30-09-1997)- Maharashtra	607900	283526	25760	2398
HFCL Infocomm Ltd. (30-09-1997)- Punjab	525000	112852	5442	* 868
Reliance Telecom Ltd. (30-09-1997)-Gujarat	288000	261158	8635	4114

* Replacement of MARR VPTs

Note: Date in bracket is the Effective Date of License

Source: TRAI IUC regulations 29 October 2003

In conclusion TRAI was of the view that it would be better to limit the disruption to the existing regime, instead of bringing about changes in the ADC regime which could create further implementation problems.

Thus, it decided to implement a limited form of the IUC regime for non-BSNL BSOs, i.e. they would keep the relevant ADC amounts only for calls originating from them. The ADC that was to be collected at termination by non-BSNL fixed line BSOs was hence removed.

- **ADC base is too small: increase the capture of ADC to all calls from everyone**

Given the large amount of ADC to be recovered from long distance minutes involving fixed lines, the ADC per minute on fixed wire-line calls had to be large since the number of such minutes available was a small share of the total minutes used (estimated at 22%).

In this background, the ability of cellular and WLL-M service providers to charge lower tariffs for long distance calls were reducing the demand from fixed lines, which in turn would have meant a further increase in ADC per minute if it was collected only from fixed line long distance minutes. Therefore, the purpose of prescribing ADC for compensating BSOs to provide affordable service was in fact being defeated.



Therefore, TRAI decided to apply ADC to all access providers barring intra-circle WLL-M and cellular calls, thus making the base larger than only the applicability when fixed lines were involved.

This ruling meant that immaterial of whether one used BSNL services at all to originate, carry or terminate a call within (or outside) India, an ADC had to be paid to the incumbent on every call made except for WLL-M and cellular intra-circle calls.

- ***ADC funding should not continue for the foreseeable future, i.e. a cut-off date should be specified***

The industry felt that with the changes in technology and a reduction in equipment costs taking place rapidly, the amount of funding required for ADC should decline.

TRAI was in agreement and observed that over time, within a few years, therefore, it may be possible to do away with the ADC regime, and that it could be merged with the USO regime. TRAI pointed out that this would be similar to the situation in most other countries, where the ADC regime had been combined with the USO regime, rather than the ADC funding being provided through a separate ADC regime.

The implicit argument was that ADC was a kind of “infant industry” subsidy being paid to the incumbent through a tax on its competition which would be removed when it was “ready” to compete in the open market. The issue however, was that given the incumbent had already enjoyed 50 years of monopoly, had it not recouped its historical costs?

- ***Uniform and differential ADC too complicated to implement***

In addition to whether a call involved a fixed line or a cellular or WLL-M line, ADC calculation also depended on distance under one alternative, and did not depend on distance under the other alternative. With this choice being given to individual operators, a chaotic situation arose when multiple operators in circles start adopting different practices. The industry argued that this difference is being misused by the NLD operators to terminate cellular to fixed inter-circle long distance calls through the POIs with other cellular networks in the terminating circle depriving the BSO of genuine termination charges.

The alternative methods of calculating ADC was scrapped in favour of the escalating by distance methodology in the October 2003 revision.

- ***Review possible reduction in the amount of ADC for ILD calls to address grey traffic***

The industry raised the point that given INR 5.00 ADC for incoming international traffic being too high, there were greater incentives to promote a grey market for ILD calls through subversions.



In the October 2003 revision, TRAI revised downwards the ADC on ILD to INR 4.25 per minute, with a view further lowering this amount over time.

- *BSNL felt discriminated by common ADC to all fixed operators*

BSNL argued that the ADC of private BSO was only INR 174 per month whereas, the ADC of BSNL was of the order of about INR 269 per month per DEL and it was unfair to provide non-BSNL basic fixed line operators the higher BSNL figure.

Based on all of the above and other detailed consultations, TRAI revised the original IUC (and ADC) regime in October 2003 as depicted in Table 2.4.

Table 2.4: Revised ADC

Access Deficit Charges in Rs per minute	Local	Intra circle calls		Inter Circle calls			ILD
	local	0-50 kms	>50 kms	0-50 kms	50-200 kms	>200 kms	
Fixed - Fixed	0.00	0.00	0.30	0.30	0.50	0.80	4.25
Fixed - WLL(M)	0.30	0.30	0.30	0.30	0.50	0.80	
Fixed - Cellular	0.30	0.30	0.30	0.30	0.50	0.80	
WLL(M) - Fixed	0.30	0.30	0.30	0.30	0.50	0.80	4.25
WLL(M) - WLL(M)	0.00	0.00	0.00	0.30	0.50	0.80	
WLL(M) - Cellular	0.00	0.00	0.00	0.30	0.50	0.80	
Cellular - Fixed	0.30	0.30	0.30	0.30	0.50	0.80	4.25
Cellular - WLL(M)	0.00	0.00	0.00	0.30	0.50	0.80	
Cellular - Cellular	0.00	0.00	0.00	0.30	0.50	0.80	

Source: TRAI IUC Regulation, 29 October 2003

Having made these substantial revisions to the ADC, TRAI assured that it would, soon review both the size of the ADC payments as well as who should benefit from the ADC regime.

TRAI suggested that it may consider funding ADC based on a percentage of the annual revenues of operators and that the ADC may be merged with the USO regime over time, say in about 3 to 5 years.

By making the many revisions to ADC, TRAI agreed that their earlier formulation was detrimental to the very service provider they were attempting to protect (BSNL) when it said "In the earlier regime 92% of the ADC revenues were being contributed by BSOs (primarily BSNL) and the ADC as a percentage of their revenues were about 40%. Instead of helping BSOs, particularly BSNL, the earlier regime could have driven them out of business."⁵

These revisions, originally expected to have been implemented by 1 December 2003, were delayed to 15 December 2003 and then finally implemented on 1 February 2004.

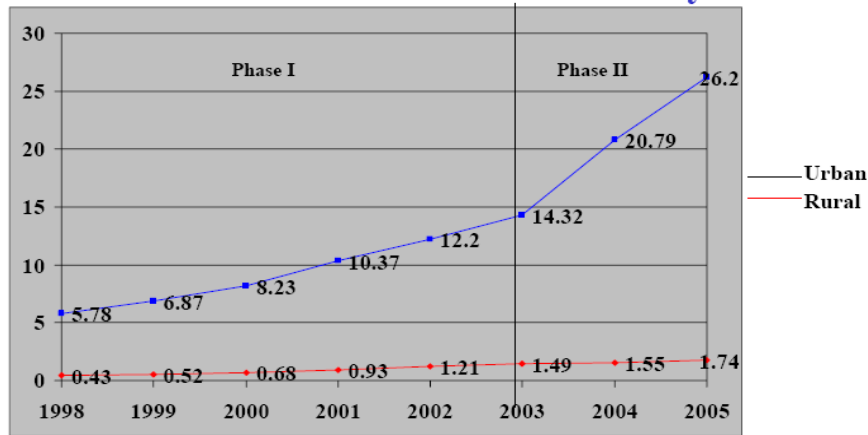
⁵ TRAI notification, 29 October 2003. Page 73.



2.4 Growth Momentum Continues

While the debate on ADC was going on, the subscriber base as a whole saw steady growth. However, as seen in Chart 2.5 below, while the urban tele-density reached 14 by end 2003 (and 20 towards the end of 2004) the trend of growth in the rural areas saw hardly any growth; moving from 1.2 at end 2002 to 1.5 at end 2003 (and 1.55 end 2004).

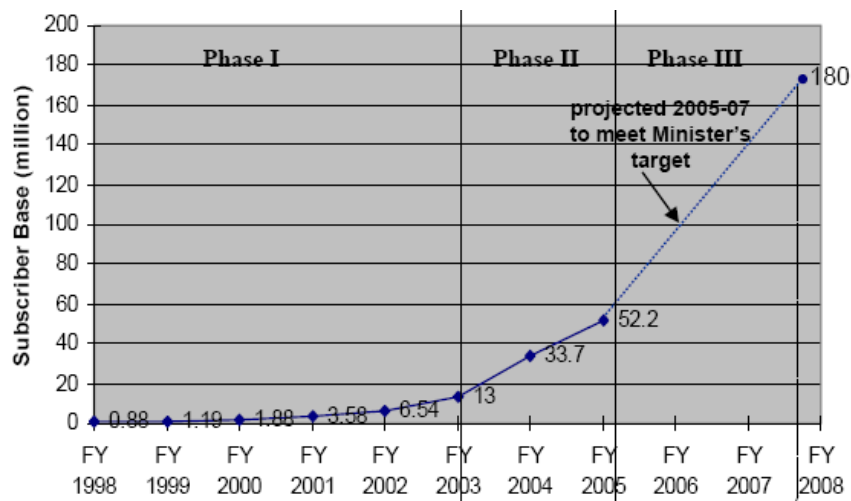
Chart 2.5: India Tele-density



Source: TRAI Study Paper on Indicators for Telecom Growth, June 2005

On the other hand, Charts 2.6 and 2.7 below indicate the actual and forecast dramatic growth in mobile subscriber base while indicating a very moderate rate of growth for the fixed subscriber base. These trends do not offer support for the logic extended for ADC in terms of improving teledensity through expanding BSNL fixed line service.

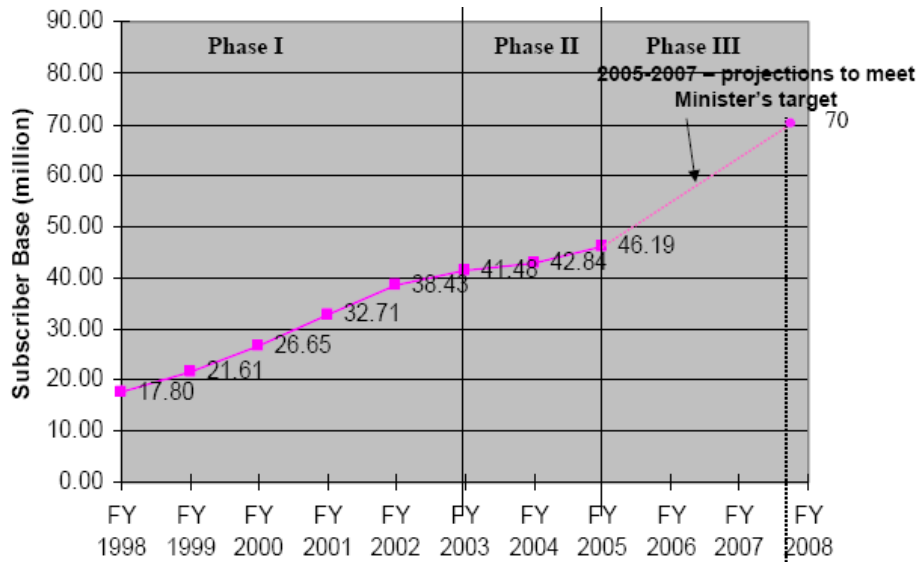
Chart 2.6: Mobile Subscriber Base



Source: TRAI Study Paper on Indicators for Telecom Growth, June 2005



Chart 2.7: Fixed Subscriber Base



Source: TRAI Study Paper on Indicators for Telecom Growth, June 2005

2.5 Further Problems and Solutions

The 1 February 2004 implementation of the revised ADC regime ran in to trouble right from the beginning. TRAI observed that, by June 2004 only a “very few” settlements had taken place. It appeared that most operators had not raised relevant invoices and their call patterns seemed suspicious; some showing no ILD calls. In fact the distance based calculation had become difficult to implement within the numerous conditions of being intra, or inter circle, and distance differences and technology used etc. On top of all this, the data reconciliation problem had got even more complicated due to BSNL not being able to complete their billing system implementation as expected.

TRAI having recognized the complexity of their methodology after two attempts and detailed consultations to perfect the calculation stated that “experience suggests that it would be useful to evolve a simpler method of collecting ADC which does not involve distance based and call based ADC, and may also be subject to easier verification.”

Having created an ADC regime that was rather complex to say the least, TRAI put out another consultation paper in June 2004 which suggested that a simpler revenue share mechanism might be the answer. TRAI proposed the new regime would be from October 2004 to September 2005 with a revenue share proposed between 2.2 percent and 5.3 percent.

Even though TRAI had expected to simplify the methodology and implement a revenue share regime, the industry was not willing to go along with such a scheme. A number of stakeholders, primarily BSNL, opposed it on the grounds that it would increase rentals and local call charges. The argument was that unlike in the USO where the revenue



share amount was collected from the existing overall license fee imposing no additional burden on the operators and consumers, the ADC revenue share regime would involve an additional imposition over and above the existing license fee revenue share. This additional burden or the increase in rental and local call charges was shown to take place because the revenue share would not compensate for the existing asymmetrically high ADC contribution levied on ILD and NLD traffic.

In this background TRAI once again revised the ADC with the following salient features:

- Continue with a per minute ADC, but at a much reduced rate: With the number of minutes available for funding ADC increasing dramatically due to more than anticipated subscriber growth as seen in Charts 2.6 and 2.7 in earlier page TRAI felt it would be possible to collect the required ADC amount with a lower charge per minute. Note however that this increase in minutes was originating primarily from cellular phones.
- Maintain the total ADC amount at the level that was provided in the regime notified in October 2003 for both BSNL and for the other fixed line operators.
- “Death of distance”: The ADC regime simplified for domestic long distance calls by applying one figure to all calls.

In this background TRAI had to grapple with the ADC amount that should be levied across the board vs. the ADC on ILD given the competing objectives of reducing domestic call charges; addressing grey market ILD calls and ensuring that the benefits do not pass along to foreign carriers and consumers at the cost of domestic consumers and operators. The assessment was based on the premise that for funding a given ADC amount, any reduction in the per minute ADC charge on ILD calls would require an increase in the ADC charge on domestic calls. Likewise, any increase in per minute ADC charge on ILD calls would result in a lower ADC charge on domestic calls. In this situation of a trade-off among these objectives, TRAI selected what it called an “appropriate balance” while specifying the new ADC with higher priority given to the objective of reducing domestic tariffs to meet domestic consumer interest, and spurring sustained growth with supplementary measures (monitoring and penalty) that will address the grey market problem.

These changes resulted in a uniform ADC of INR 0.30 per minute for all calls across the nation (with the continued exception of intra-circle WLL-M/cellular to WLL-M/cellular); INR 3.25 per minute for incoming ILD calls and INR 2.50 on outgoing ILD calls as depicted in Table 2.10.



Table 2.8: Further Revised ADC

A D C	Local		Intra circle calls			Inter Circle calls				ILD		ILD	
	local	0-50 kms	>50 kms	0-50 kms	50-200 kms	>200 kms			Outgoing		Incoming		
	Prevailing & New	Prevailing & New	Prevailing & New	Prevailing & New	Prevailing	New	Prevailing	New	Prevailing	New	Prevailing	New	
Fixed - Fixed	0.00	0.00	0.30	0.30	0.50	0.30	0.80	0.30					
Fixed - WLL(M)	0.30	0.30	0.30	0.30	0.50	0.30	0.80	0.30	4.25	2.50	4.25	3.25	
Fixed - Cellular	0.30	0.30	0.30	0.30	0.50	0.30	0.80	0.30					
WLL(M) - Fixed	0.30	0.30	0.30	0.30	0.50	0.30	0.80	0.30					
WLL(M) - WLL(M)	0.00	0.00	0.00	0.30	0.50	0.30	0.80	0.30	4.25	2.50	4.25	3.25	
WLL(M) - Cellular	0.00	0.00	0.00	0.30	0.50	0.30	0.80	0.30					
Cellular - Fixed	0.30	0.30	0.30	0.30	0.50	0.30	0.80	0.30					
Cellular - WLL(M)	0.00	0.00	0.00	0.30	0.50	0.30	0.80	0.30	4.25	2.50	4.25	3.25	
Cellular - Cellular	0.00	0.00	0.00	0.30	0.50	0.30	0.80	0.30					

Source: TRAI

What the new ADC regime meant was that all operators would need to collect the now lower INR 0.30 ADC (with the intra-circle WLL-M/cellular to WLL-M/cellular exception) and pass it on to BSNL. Non-BSNL fixed BSOs were allowed to retain originating ADC as before.

With this yet again revised ADC slated to go in to effect on 1 February 2005, TRAI reserved the right to evaluate the progress in 3 to 6 months and make any relevant changes without any further consultation. However, TRAI noted that another consultation paper would be brought out on admissibility and quantum of ADC for fixed line operators based on an examination of the relevant network elements data, including the verification of the cost items that were presented in the annual reports of service providers, the implementation of the USO regime, continued admissibility of WLL-F for ADC, and other factors affecting the ADC estimates. It noted that this review may also cover a review of the IUC regime.

With this reduction on ADC, primarily on ISD calls by 41% and on STD calls by 61%, mobile subscriber bills on ISD charges fell by average between 11% and 24% while STD call rates fell by between 16% and 27%. Immediately after announcement however, BSNL claimed that they would take a financial hit of about INR 12,500 million annually (Calculated as INR 3,000 million from outgoing ISD traffic, INR 1,700 million from on incoming calls and INR 7,800 million from the reduction of ADC on STD calls). BSNL was of the view that long-distance traffic would not increase in the same ratio as the number of subscribers. With the exclusion of fixed line operators other than BSNL from retaining ADC on incoming calls, MTNL also projected a loss of INR 4,500 million.

But from TRAI's point of view their objective of protecting the incumbent in the transition was now effectively being met with a lower ADC given the massive increase in minutes, primarily via cellular traffic.



2.6 Final Consultation

Based on the above communication of January 2005, TRAI put out the said consultation paper on 17 March 2005 with a number of points relevant to the ADC regime. They inter alia dealt with the justification of ADC on rural and urban fixed wireless lines and admissibility of ADC for non-BSNL fixed line operators and agreeing on revenue share methodology for ADC prior to being unified with the USO fund.

- *Why should ADC not be applicable for rural wire-lines only*

One of the key issues brought out was whether ADC should be applicable only to rural fixed wire-lines. From the beginning of the ADC regime, TRAI did not consider ADC as a “rural subsidy” and the deficit was calculated as an average of all fixed lines in both urban and rural areas.

Table 2.9 below illustrates the situation (as at end September 2004) with regard to the role played by BSNL in the provision of rural fixed lines in rural India.

Table 2.9: Provision of Rural Fixed Lines by Operator and Technology

Percentage distribution of FWT lines in the total Fixed Subscriber Base of Fixed Operators and Percentage of Rural lines in total Fixed Lines provided by Fixed Operators as on 30th September 2004

Service Provider	Name of the Circle/ Service Area	% of Fixed Wireless Lines in Operator's Fixed Lines	% of Rural lines in Operator's Fixed Subscriber Lines
BSNL	All India (except Delhi and Mumbai)	2.60	35.20
MTNL	Delhi & Mumbai	1.09	0.00
Bharti	Delhi, Madhya Pradesh, , Tamil Nadu, Karnataka, Haryana, Chennai	3.46	0.08
TATA	Maharashtra, Mumbai, Andhra Pradesh, Tamil Nadu, Chennai, Karnataka, Delhi, Gujarat	77.39	0.23
Shyam	Rajasthan	18.49	3.37
HFCL	Punjab	24.53	0.45
Reliance	All Circles except Assam and North East	97.27	0.66
TOTAL		7.70	28.93

Source : Operators' Submission to TRAI

While admitting the justification of higher ADC for rural lines TRAI however noted in the context of ADC the rural vs. urban comparison per se was less meaningful than the implications of the network's distribution of urban/rural lines in terms of costs and revenues. Also, the complexity in obtaining and authenticating data for calculating cost based rural ADC, particularly with respect to non-BSNL operators was a major practical problem given that investments were lumpy and was not necessarily demarcated by urban and rural.



- ***Why should non-BSNL operators should not receive ADC***

In terms of reassessing if ADC should be paid for non-BSNL operators, TRAI was of the firm view that access deficit compensation “did not arise out of any legal right but out of consideration of smoothening the transition process during competition, i.e. providing support during the transition period when costs of access are not fully recovered from the revenues from access line monthly rentals under existing tariff regime due to competition in the market and other factors”. TRAI calculations over time had indicated that by considering the total areas of operation, the access deficit for non-BSNL fixed line operators were in fact much lower, if at all. In addition, in all its ADC calculations, TRAI had been attempting to keep call costs at a minimum possible to boost growth.

- ***Why should WLL-F be treated similarly to fixed wire-line***

For ADC purposes, calls to and from WLL-F had always been treated similar to calls to and from fixed lines. In fact, fixed wireless lines had become the primary method of expansion of the non-BSNL fixed line operators as seen in Table 2.9 above. But, the question had arisen if it was a fair practice to adopt as WLL-F could be considered tantamount to full cellular services which could be offered seamlessly throughout the service area.

TRAI while agreeing that access deficit of WLL-F was negligible and also agreeing that certain amount of misuse in terms of physical movement of WLL-F phones were taking place was of the view that given the current inability to distinguish calls originating between fixed lines and WLL-F that the regime should be maintained until it was technically possible to separate them out. In the meantime TRAI had requested that WLL-F phones be locked (to a particular RF section of the base station) to limit physical movement of the phone.

- ***Should revenue share be introduced to calculate ADC***

Another point of recurring contention was the moving to an ADC regime based on revenue share. Here a crucial factor was the large transition that would be required if the ADC amount charged per minute for ILD calls were converted into a revenue share. TRAI was of the opinion that the transition would become easier if the corresponding ADC per minute amount was lower and could be distributed more easily on a larger base of minutes and revenues that will generate ADC funds. Over time, this would become possible as the increases in the subscriber base would result in much larger number of minutes that generate the ADC funds, and as the ADC amounts themselves decrease. They argued that would help avoid a “large transition” that would otherwise be required.



2.7 Remaining Issues with ADC

The ADC, even after the many revisions, continues to be conceptually complicated, discriminatory, technologically biased and with insufficient calculation transparency. The following section deals with some of the key issues that need addressing.

- ***ADC has a specific objective and that does not include any “rural obligations”***

The Government and TRAI had stated that ADC is required for providing basic telecom services affordable to the common man to promote both universal service and universal access. Some in the industry however have interpreted this at different times to be a “subsidy” required to provide access to rural and remote areas of the country where phone services do not cover the cost of providing such services because rentals which are fixed by the regulator were below costs.

In this context it must be pointed out that after November 5, 2003, urban tariffs were foreborne and not mandated by the regulator. Thus, *ipso facto*, ADC was justifiably perceived as a compensation for below cost tariffs in the rural areas. Moreover, given that urban tariffs for basic services had also been left to the market forces, TRAI should not have let urban fixed lines attract ADC. But ADC had a far broader reasoning; to give the incumbent sufficient time to recoup its stranded costs based on historical costs, such that the new technologies do not cannibalize copper which the incumbent had adopted. This would have also meant a substitution of technologies (concept known as disruptive technologies) by the consumers and in the background of an improper spectrum pricing a clamor for the scarce resource.

The objective of ADC must be made very clear; that it does not have any rural obligation; but has a rural bias because access deficit is higher in the rural areas due to affordability (and mandated below cost tariff) issues. Also it must be made clear that ADC is based on overall access deficit and not on deficit in either rural only or low-user urban only areas.

- ***BSNL is provided ADC for high historical costs, so non-BSNL fixed line operators (and any others) do not qualify for ADC***

If access deficit is defined for fixed lines, some feel that there is a strong case for providing ADC support regardless of the fact whether the service provider is BSNL, or any other. However TRAI’s logic is that ADC is for a smooth transition for BSNL during the period in to competition.

The counter argument to this position is that BSNL was created out of DOT some five years ago after decades of monopoly profits and that any transition to a competitive market should now have been complete. It is further argued by industry that prior to the induction of private operators in basic services in 1995-96, DOT provided services in rural areas as part of its social objectives and that for these efforts, private operators cannot be penalized or BSNL be rewarded in the post reform era.



TRAI contends however that BSNL does not have any accounts during the period when it was a unit of DOT and that it is assumed that it did not earn monopoly rents that would have covered its large and costly rural rollout obligations. However this argument is suspect, since the outcomes on not only universal service but roll-outs were poor indicated by long waiting lists. Also, there is agreement among many that the incumbent carries a large amount of excess baggage in terms of organizational inefficiencies which are being subsidized by ADC.

- *The existing ADC regime reduces incentives for lower cost technology solutions in the rural areas.*

The continuation of ADC in the current format also needs to be considered in terms of the technology bias it builds in. It is a fact that BSNL has, for a long time provided rural services using wire-line technology. However it is also a fact that the cost of providing the same service using wireless technology is much more economical, and such is being observed across the board by non-BSNL operators. Even though BSNL was free to deploy new wireless technology since private operators were enabled to adopt WLL as an access technology in 1998, BSNL did not do so in a significant manner as shown in Table 2.9.

But, ironically, the ADC is calculated based on the (historical) cost of providing the more expensive fixed wire-line services by BSNL. In this background, the issue is whether TRAI should penalize operators for deploying latest technologies vis-à-vis BSNL's choice of technology. This mechanism in fact amounts to a situation where private operators are compensating BSNL for the "wrong" choice of technology. Some stakeholders even stretch to argue that BSNL should refund the ADC for all DELs added by BSNL after October 2000. The more important point however is that, were BSNL to increase its deployment of wireless technology, the costs that need to be supported by the ADC would diminish ensuring a lower, more affordable service.

In addition, it stifles the introduction of lower cost technology (particularly niche technology in rural and remote areas) by non-BSNL operators in rural areas where market driven lower tariffs may not provide sufficient revenue to make such solutions viable on top of ADC to be recovered and paid to BSNL for their high cost solutions in the same areas.

- *Is argument for ADC for basic stand alone services valid anymore?*

Many in the industry argue that parameters that have been accepted internationally as the key pre-requisites to be fulfilled before ADC can become applicable have not been met in India. Normally ADC is attracted when the service is stand-alone; the tariff is fixed by the regulator; and revenues from the service is below costs.

Industry therefore argues that in the Indian context, these criteria can apply only for fixed line services provided in rural areas and not for all fixed line phones across the country. Also whether the services provided by BSNL are stand-alone products or a



part of a bundle of other services such as NLD, ILD and other value added services is questionable. In fact it is alleged that BSNL is using some of the same infrastructure for its mobile services in remote and rural areas thereby spreading the capital expenditure and revenue recovery over a wider range of services. The valid point is that this provides BSNL a cost advantage to compete with other private operators.

But at a broader level, the question is, why only basic services? The reason for this decision was that at the time the ADC was originally designed in January 2003, basic telecom service providers who had historically run cross-subsidies by which relatively high long-distance tariffs brought in surpluses which were used to offset the losses that would otherwise have resulted in rural low revenue areas were unable to do so with competition eroding the margins available in the long-distance segment. The ADC was designed to provide these basic service operators the ability to cover the gap between tariff and costs. The emphasis on basic service operators was due to the fact that the number of fixed line subscribers far exceeded the mobile subscribers and the likely trends at that time continued to show a major dominance of the incumbent basic service operators (BSNL and MTNL) for the next few years. However, the circumstances have now changed. The growth of fixed and mobile subscribers during 2004-2005 in comparison to earlier years is shown below in Table 2.10.

Table 2.10: Growth in Fixed and Mobile Subscriptions

<i>Service</i>	<i>March 03</i>	<i>March 04</i>	<i>March 05</i>	<i>% growth during year</i>
1.Fixed including WLL-F	41.48	42.58	45.9	8
Mobile including WLL-M (CDMA + GSM)	13.00	33.58	52.17	55
Gross Total, millions	54.48	76.16	98.08	29

Source: TRAI Press Release, Growth in Telecom Services 2004-05

The number of mobile subscribers now exceeds the number of fixed line subscribers. Thus, the circumstantial reason for placing an emphasis on basic telecom services does not necessarily stand any more.

In this backdrop, perhaps TRAI should focus on achieving the objectives of universal service and universal access by providing equal emphasis to all telecom services, rather than being biased with just basic telecom services. However, this implies a reversal of ADC objectives of TRAI from protecting BSNL to one of network development in rural areas.

- ***Does the ADC regime encourage parallel markets?***

The industry feels that the ADC on ILD calls should continue on a per minute basis till the overall requirement of ADC reduces significantly. The existing ADC on ILD



calls is far higher than the ADC on domestic long distance calls and contributes significantly to the overall ADC requirement and a transition to ADC based on percentage of adjusted gross revenue for ILD calls would reduce this contribution significantly and shift the burden of a large portion of the ADC from foreign operators to domestic customers.

From a bypass point of view, the main problem with the ADC scheme is that it rewards those who can avoid or evade the pricing and payment rules that are defined in the ADC scheme. The industry is forthright in pointing out that characterized by the rapid technological development and convergence, some types of by-pass of ADC regulations cannot be prevented. ADCs will encourage the use of technologies that do not have to pay ADCs or pay ADCs only on one part of the service, such as can occur when a mix of packet and switched technologies are used in the service such as Voice over IP networks. The use of VSAT, private networks, call-back and possibly off-peak transmission over cellular and fiber infrastructure owned or leased by mobile operators, are other examples of ways the rules can be and are avoided.

- *ADC needs greater calculation transparency*

BSNL continues to argue that many wrongs have been committed in calculation of ADC funding of BSNL and that they should be duly compensated for these mistakes. They point out that this amount is some INR 64,650 million, which adds to total arrears due to BSNL of approximately INR 110,000 million on account of poor collection efficiency.

Related to this point is the issue of transparency in calculating the ADC. There have been complaints that TRAI has been less than open to sharing data and information. The responses to the consultation paper points out that under its Act, TRAI is required to ensure transparency while exercising its powers and discharging its functions. They continue to point out that having issued the Access to Information Regulation in March 2005, which upholds the rights of all stakeholders to have access to the information obtained or received by the TRAI the authority has not been forthcoming with certain information, referring to the VSNL vs. TRAI Appeal No. 5 of 2005 decision of 28.4.2005.

Private operators further argue that with BSNL being the beneficiary of the subsidy, it should stand up to transparent scrutiny and justify the quantum being availed or claimed, more so when it happens to be the largest telecom service provider in the country and also being a fully state owned enterprise.

- *Difficult to implement*

Implementation of the ADC regime continues to be difficult. Having started in 2001 December and having issued the first order in 2003 May, the implementation was revised and reimplementation in 2004 February (delayed from 2003 December); and



again in 2005 February. But, as of mid 2005, the implementation problems continue and the entire regime is being questioned.

Having started out with a very complex calculation, the multiple revisions have simplified the ADC to almost child's play after paying a heavy price for the confusion, uncertainty and the various allegations of lack of transparency and bias it attracted.

2.8 Possible way forward with ADC

The analyses made in the sections above indicate that while the objective of ADC is valid at the macro level of *providing affordable telecom services to the common man*, its design and implementation could have been improved based on the many issues that had been raised at the more micro level.

While agreeing with the argument that BSNL has been and continues to be the main provider of telecom services to the vast rural masses of India, the current ADC regime however provides an undue competitive advantage to BSNL and creates a situation where inefficient technology is being subsidized at the expense of cheaper and more efficient technology of its competitors.

To meet the objectives of the Government of India and TRAI, the simplest approach perhaps would be to merge the ADC with the existing USO on a simple, technology neutral, revenue share model. Disbursements from the combined fund could be made to compensate mandated "below cost" services being provided by any operator, perhaps anywhere (depending on where tariff ceilings are effected). Over time, the size of the ADC fund could be reduced because for one, the USO fund would continue to grow on account of increasing sector revenues and two, the introduction of new technologies and growth in markets, the need for ADC itself would be reduced.

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3.0 Conclusions

The WTO reference paper on telecommunications states the following in the context of universal service obligations being undertaken by any member:

Any member of the WTO has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the member.

In this paper our attempt has been to analyze the Indian universal service instruments both, USO as well as ADC in this context. The questions we addressed were: How well do the Indian universal service instruments stand the test of (a) not being anti-competitive; (b) transparent in their administration; and (c) non-discriminatory and competitively neutral. Unfortunately, the universal service policy has been biased in favour of the incumbent. Though the approach that has been followed in selection of the universal service provider in India is a transparent multi-layered reverse bidding process (in which the least quoted subsidy below the reserve price became the representative rate at which subsidy was disbursed to the successful Universal Service provider) and the competitive bid process has led to a significant lowering of the benchmark subsidy rates, bringing it down to 65 to 70% in the case of rural direct exchange lines (RDELs), there have been concerns that in the absence of network competition the incumbent has leveraged its vertically integrated status even in a transparent disbursement mechanism. The competitive non-neutrality of these instruments is therefore a major concern.

The incumbent had an edge over its competitors as it had a large amount of the static infrastructure or backbone, and it has been able to foreclose entry by making entry for the new entrants into rural markets unviable even with subsidy. It is not surprising therefore that almost 75 percent of the subsidy auctions were won by the incumbent. As noted in this paper rural connectivity could have been seen as an opportunity and not as an obligation, had this structurally imbalanced situation in which the incumbent had a huge volume of the essential facility on which the new entrants relied had been shared for extending access. If that had been allowed then the viability concerns for the new entrants would have been limited to the costs of technology that go into the backbone i.e. the access network costs. In the current design, the new entrant has to factor in the costs of laying the backbone while deciding its entry into the rural markets. As discussed in the paper, this was not done despite the presence of excess capacity in the backbone infrastructure. India has vast infrastructure resources lying in the ground or under water – but the fibre has not been lit. Thus, our research suggests that in future the universal service policy should be devised by factoring this in. The advantages will be twofold: (a) costs of universal service will be low and hence coverage greater for the same costs; (b) universal service will be competitively more neutral and avoid the pitfalls of market abuse by the incumbent. In such a scenario the universal service costs will be largely due dynamic costs of the backbone technology, i.e. the cost of access technology. Moreover, if the access technology is not predefined various technological options to



minimize costs can be chosen. For example, it is irrational to build a public switched telephone network (PSTN) infrastructure in India when voice over internet protocol (VoIP) is cheaper by at least 70 percent. Given the multifunctionality of this technology the costs can be spread over its diverse uses, voice and data. To this end it is therefore important that universal service is accompanied by regulations which impose special obligations on the dominant operator and enforces its compliance, which in turn will counterbalance its market power. Second, certain other steps like lowering the tax burden on the operators can reduce the endogenous costs of telecom business and make rural entry a viable business opportunity. This measure will also encourage other small private sector operators with not so deep pockets provide innovative and cheap solutions for access as long as they have access to the state-owned incumbents already developed trunk fiber. If the state is serious of diversifying network participation then it should see that narrow ministerial considerations do not impede such regulations. Once these regulatory design is in place the private sector and competition, will take care that affordable services are available to all.

Having arrived at the above not so positive conclusions on the universal service fund mechanism our research in to the Access Deficit Charge also leads us to conclude that notwithstanding the explanations TRAI has provided to the numerous questions raised by the industry over India's ADC, that the ADC is a quasi-politically motivated tax on private operators to protect the incumbent BSNL during what seems like a very long transition period to competition.

While the ADC has been able to sustain BSNL's high cost operation, not purely due to its high historical cost access network that TRAI refers to, but also its bloated staff and inefficient processes akin to incumbent operators pretty much cross the world, the reason why it has not seriously impacted private operators negatively has nothing to do with TRAI's safeguards for them. It has been the massive growth in the mobile sector that has created an equally massive volume of minutes to pass on a reduced ADC to a greater number of customers.

It seems that TRAI is adamant to protect BSNL during the transition when its action indicates that ADC is nothing more than an attempt to save the copper wire network so that at a later date if it becomes necessary the nation would be able to take advantage of the same. However, TRAI could well consider other more market friendly and more efficient ways of protecting the copper network instead on taxing efficient operators to keep an inefficient operator who owns the copper network afloat. As pointed out earlier the ADC seems to have created a fixed wire-line bubble that would burst unless continuously supported by ADC or some other format of a subsidy. But such subsidies cannot be sustained for any significant period of time without distorting the entire market. What happens when the ADC is phased out in total? If BSNL has then grown up to face a competitive market well and good; if not does it mean that all the taxes extracted from private operators to keep BSNL afloat would have been a complete waste?



Annex



Annex 1

Guidelines for Implementation of Universal Service Support

1. The New Telecom Policy'99 envisaged provision of access to basic telecom services to all at affordable and reasonable prices. The resources for meeting the Universal Service Obligation (USO) shall be generated through a Universal Service Levy (USL), at a prescribed percentage of the revenue earned by the operators holding different type of licenses. Further, NTP'99 envisaged implementation of Universal Service Obligation for rural and remote areas through all Basic service providers who will be reimbursed from the funds collected by way of USL. Other service providers shall also be allowed to participate in USO provisioning subject to technical feasibility and shall be similarly reimbursed out of the funds of USL.
2. It has been decided to extend support to the Universal Service from the Financial Year 2002-03 and the following are broad guidelines for implementation of Universal Service Support Policy:
 - i) The funds created by the Universal Service Levy shall be spent in rural and remote areas on both the public access telephones or Community telephones meant for public use and individual household telephones in net high-cost rural/ remote areas.
 - ii) The support from Universal Service Fund will be provided to meet Net Cost (i.e. Cost minus Revenue) of providing the universal service.
 - iii) In the event of an increase in the requirement of Universal service Obligation (USO), the percentage of contribution towards USL can be raised to meet such additional requirement but the added levy will be drawn out of the prevalent percentage of license fee keeping the ceiling intact and as such, will not cause any additional burden either on the service providers or the consumers.
 - iv) The implementation of USO will be divided into two clearly identifiable streams:

A) Stream-I

B) Stream-II

A) Stream-I: Provision of Public Telecom and Information services

- a) **Installation of VPTs in the remaining villages.** For installation of VPTs in the 6,07,491 villages, identified as per 1991 census which were required to be covered by 31.3.2002, no reimbursement towards Capital recovery shall be admissible and given. However, the Net Cost towards operating expenses of these VPTs will be reimbursed. For the remaining villages, i.e. additional revenue villages identified as per 2001 Census, the Net cost towards both, the annual capital recovery as well as annual operating expenses will be allowed as a support from the USF.
- b) **Provision of additional rural community phones in areas after achieving the target of one VPT in every village.** The second public phone will also be installed in villages where population exceeds 2000. These may be provided in public places such as schools, primary health centers etc and for the



- purpose of support from the USF, the Net cost towards both annual capital recovery as well as annual operating expenses will be allowed.
- c) **Replacement of VPTs installed before 1.4.2002.** A large number of VPTs working on MARR Systems will in the first instance be required to be replaced to ensure their reliable operation. The BSOs will be required to draw up a yearly plan for replacement of such VPTs and support from USF will be allowed towards both the annual capital recovery as well as annual operating expenses.
 - d) **Upgradation of VPTs to Public Telecom and Info Centers (PTICs).** It shall be endeavoured to provide, by the year 2004, for data transmission facilities within 5 Kms of every village and at least in all those villages where regular post offices are located. The reimbursement from the USF will be towards Net Cost that may arise if the PTICs are engineered by upgrading an existing VPT, with the minimum configuration of i) a PC, ii) a Modem and iii) an UPS. Both capital and operational cost will be taken into account to determine the quantum of support from USF. A phased programme will be drawn and implemented to upgrade about 35,000 VPTs to function as PTICs by end of year 2004.
 - e) **Installation of High Speed PTICs (HPTICs)** by upgrading the existing VPTs to provide wide band applications like tele-education and tele-medicine based on two basic channels i.e. 128 Kbps. In the first phase by 2004, about 2 HPTICs shall be set up in each SDCA, Both capital and operational costs will be taken into account to determine the quantum of support from USF.

B) Stream-II: Provision of household telephones in Net High cost areas (rural/remote)

For Stream II, the cost of service in the SDCAs will comprise the capital recovery and operating expenses in respect of the access network, developed for DELs installed after the specified date. Per line net cost will be worked out on the basis of SDCA average. At the beginning of each Financial Year, the service providers would indicate their SDCA-wise roll out plan including projected cost and revenue. The rural SDCA as per list issued by Department of Telecommunication shall be treated as rural SDCA for this purpose. The subsidy will be automatically withdrawn as soon as any SDCA's net cost becomes zero i.e., it becomes a revenue surplus area.

- v) While the implementation of stream-I and stream-II would be simultaneous, stream-I, i.e. stream relating to provision of common access (VPTs & PTICs) will receive priority. However, the support (towards OPEX only) to rural household DELs provided prior to 1.4.2002 in the rural SDCAs shall be given along with stream-I. (*Amendment dated 3.2.2003*)
- vi) The details as required and decided by DOT shall be furnished by the BSOs in regard to installation of Rural Community Phones and Replacement of VPTs by such dates as may be determined from time to time by DOT. These shall amongst others include number of VPTs to be replaced/installed with details of their locations, technology employed, distance from exchange and Average Revenue per VPT etc.



- vii) The implementation of Universal Service Obligation shall be through a multi-layered bidding process on the Least Quoted Subsidy support basis. For this purpose, the first round of bidding will be amongst the existing Access providers (BSOs and CMSPs) of the concerned Service area. Where no bids are received from any of the BSOs/ CMSPs in the concerned service area, or the lowest bid is higher than the benchmark, then a fresh round of bidding shall be called from where all the BSOs and CMSPs in the country including the ones in the concerned service area as well as their franchisees. However, the award of contract as a result of bidding process will not be treated and taken as grant of fresh license under Indian Telegraph Act 1885.
- viii) The existing Service Areas as defined in the Basic Services Licenses shall be the unit of bidding for US support. The bids shall be called for separately, for each Service Area or part thereof.
- ix) The lowest bid, offering the least subsidy shall be accepted subject to a ceiling of the benchmark cost as determined by DOT. A subsidy higher than the benchmark shall not be accepted, and may either call for negotiations or further round of bidding.
- (x) For calculation and estimating benchmark cost, fully allocated current costs method shall be adopted, considering the most effective solution for a particular location/ area. For operating expenses, the costs will be calculated on the basis of operations run most efficiently.
- (xi) A separate fund for crediting the receipts towards USO is being set up and will be presently administered by the DoT.
- xii) The Universal Service Support shall be reimbursed on the basis of the actual physical performance. Such reimbursements shall be made on completion of the targets & after necessary verification of the same. Liquidated Damages shall be imposed in accordance with devised scheme for any shortfall in the achievement of targets.
- xiii) The DoT or its authorized representative shall have the right to inspect the sites used for extending the service.
- xiv) The DoT will ordinarily carry out all inspections after reasonable notice except in circumstances where giving of notice is not feasible or will defeat the very purpose of inspection. In such event, an inspection will be undertaken without prior notice.
- xv) The DoT reserves the right to modify these guidelines or incorporate new guidelines considered necessary in public interest, security, and for proper conduct of telegraphs.
- xvi) The detailed terms and conditions applicable to the bidding process shall be given separately.



Annex 2

- (i) The bidding process has been structured as “Multi-layered Informed Descending Bidding Process.” The pre-qualification bid along with EMBG and the first Financial Bid will be submitted by the bidders in separate sealed covers. The first Financial Bids of those who qualify shall be opened and shall be made public in the presence of bidders’ authorized representatives, carrying such authority/document with them.
- (ii) The bidders can offer less than or equal to the Benchmark for the front loaded subsidy Offers higher than the Benchmark for the front-loaded subsidy or where all the specified SDCA in a SSA have not been bid for, shall not be treated as a valid bid.
- (iii) The lowest valid offer for an SSA will determine the reserve price for the front loaded subsidy for each SDCA in a SSA for the second round. If there are more than four pre-qualified bidders for a SSA, the **highest** bidder will be dropped and others will qualify for the second round of financial bidding. If pre-qualified bidders are four or less, all will qualify for second round of financial bidding. If there is only one bidder with a valid bid, then that bidder will be declared as the successful bidder and there shall be no further round of bidding.
- (iv) The bidders, except those last dropped, shall submit a Second Financial Bid for the second round. The bid amount in the second round will have to be equal to or lower than the ‘Reserve Price’ for each of the SDCA in the SSA and the bidder(s) quoting above the Reserve Price shall be disqualified for further round of bidding.
- (v) All the bidders who have quoted less than or equal to the ‘Reserve Price’ for the front loaded subsidy for each of the SDCA in a SSA in the second round of financial bidding will be short-listed. If there are three or more such short-listed bidders in a SSA, except the highest bidder, the rest will qualify for the third round of financial bidding. In case there are two bidders, both will qualify for the third round of financial bidding. In case there is only one short-listed bidder, then that bidder will be declared the successful bidder and there will be no further round of bidding.
- (vi) The lowest valid offer for an SSA will determine the Reserve Price for the front loaded subsidy for each SDCA within an SSA for the third round. The bidders, who qualify for bidding for the third and final round, shall be required to submit the third and final bid for all specified SDCA within a SSA for which they have qualified in the previous round. The bidder of the final round of financial bidding with the lowest offer for a SSA will be declared successful for signing of the Agreement.
- (vii) In case of a tie in the conclusive round of bidding, the bidder who quoted lower amount in the previous round for a SSA shall be declared successful for signing of the Agreement.
- (viii) In the event of a tie in the previous bidding for selection, the process of bidding will continue until a successful bidder emerges on comparison.



- (ix) The signing of Agreement as a result of bidding process will not be treated and taken as grant of fresh License under the Indian Telegraph Act, 1885.
- (x) If the Agreement is not signed with the successful bidder for whatsoever reason, the Administrator may decide to continue with the present bidding process till it is completed and the Agreement is signed with the successful bidder.
- (xi) In every successive round of bidding, the bidders can only lower or retain the front loaded subsidy of their last bid. Withdrawal or backing out of their last quoted front loaded subsidy will attract forfeiture of EMBG.



Annex 3.1

License fee of various telecom operators

Type of License	Annual License Fee (% AGR)	Annual license fees excluding present level of USO
Cellular Mobile*	Type A – 10%	Type A – 5%
Basic Service	Type B – 8%	Type B – 3%
Unified Access Service	Type C – 6% / 5%	Type C – 1% / 0%
National Long Distance	15%	10%
International Long Distance	15%	10%
Global Mobile Communication by satellite	10%	5%
VSAT	10%	5%
Infrastructure Providers Cat II	15%	10%
Radio Paging Service Providers	5%	0%
Public Mobile Radio Trunked Service	5%	0%
Internet Service Providers	0%	0%
Infrastructure Providers Cat I	0%	0%



Annex 3.2

Increased Revenues of Government after revenue share was introduced due to higher growth rate in mobile services

Statement of Revenue to be received by Central Government							
		1	2	3	4	5	6
	Year	Licence fee under old regime	Licence fee under new regime (Post II TP 99)	License Fee as per 2001 Regime	License Fee as per 2003 Regime	Service tax (Estimated)*	License Fee + Service Tax
1	1999-00	1603	275	209		110	319
2	2000-01	2270	619	468		248	716
3	2001-02	2734	793	602		317	919
4	2002-03	2455	872	657		349	1006
5	2003-04	2470	1727	1296		1105	2402
6	2004-05	2511	2698		1666	1727	3392
7	2005-06	2591	4586		2831	2935	5766
8	2006-07	2680	7796		4813	4989	9802
		19314	19366	3234	9309	11780	24323
				12543			

Note: Rate of Service Tax taken as 5% up to 13.5.2003 & 8% thereafter (presently 10%)

*Estimated Service Tax (based on Estimated Gross Revenue)

Annex 3.3

Regulatory Levies on mobile services in some developing countries

	Pakistan	Sri Lanka	China	India
Regulatory Charges	%age of revenue	%age	%age of revenue	%age of revenue
Service Tax, GST	GST	VAT	3%	8% + GST
License Fee	0.5% + 0.5% R&D	0.3% turnover (t.o.) + 1% of capital invested (inv)	NIL	5~10%
Spectrum Charge	Cost recovery	~ 1.1% of t.o.	~0.5%** (China Mobile)	2~6%*
USO	1.5%	Nil (only on ISD calls)	Nil	Incl in license fees
Total Regulatory charges	2.5% + GST + cost recovery	=1.3% t.o. +1% inv + VAT	~0.5% + 3% (Tax)	15%~24% + GST



Annex 3.4

Statement of Estimate of Government Levis from License Fee, Spectrum Fee and Service Tax on Telecom Services

Rs. Crores

1	2	3	4	5	6	7	8
Year	Gross revenue	Pass through	Adjusted gross revenue	License Fee*	Service Tax [†]	Spectrum Charge [‡]	Total Govt. Levis
2002-03	48000	7200	40800	4080	2040	206	6326
2003-04	61000	9150	51850	4770	4148	434	9353
2004-05	80000	12000	68000	6256	6800	856	13912
2005-06	100000	15000	85000	7820	8500	1530	17850

Notes:

*Weighted Average License fee of Industry is 9.2% and applied on Adjusted Gross revenue. License Fee for Basic telephone, Cellular Mobile, NLD, ILD, Internet services etc. varies from 0% to 15%.

[†]Service Tax applied on Adjusted Gross revenue as it is not charged on Interconnection Usage Charges, etc. Service Tax rate for 2002-03 – 5%, 2003-04-8%, 2004-05 & 2005-06 – 10%.

[‡]Spectrum Fee varies from 2% to 4%, depending on amount of allocated spectrum. Weighted Average Spectrum Fee for years 2002-03 to 2005-06 is estimated as 3%, 3.4%, 3.8% and 4% respectively. Contribution of Adjusted Gross Revenue from wireless services for corresponding period is estimated to be 17%, 25%, 33% and 45% respectively.



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